UC **SANTA BARBARA**

Department of Earth Science

Speakers Club

WEBB 1100 • THURSDAY APRIL 19th., 2018 • 3:30 PM

Two Oligocene 'Notohippids' (Mammalia, Notoungulata, Toxodontia) from the Central Chilean Andes: Taxonomy and Phylogeny

John Munson
Department of Earth Sciences
UC Santa Barbara

Volcanoclastic deposits within the Abanico Formation of the Andean Main Range of central Chile have recently produced new Cenozoic fossil assemblages. Some Chilean faunas represent a time unsampled elsewhere in South America. These rocks are an unanticipated source of fossils which record an important period of South American mammal evolution. Here I describe two Oligocene 'notohippids' from the Abanico Formation and incorporate them into a phylogenetic analysis. 'Notohippidae' is an extinct paraphyletic group of medium-dog-sized mammals endemic to South America from the Casamayoran (middle Eocene) to Santacrucian (early Miocene) South American Land Mammal Age (SALMA). The name "Notohippidae," which translates to "southern horse," reflects the group's convergent resemblance to horses. This clade belongs to a diverse group of native South American herbivores, the notoungulates. SGOPV 3750, a cranium bearing a partial upper dentition, represents a new taxon. It was recovered from talus near Upeo, Chile, ~200 km SSE of Santiago and the first fossil described from this locality. SGOPV 3221, a nearly complete upper dentition, was collected from the Las Leñas drainage basin (100 km SSE of Santiago). It is tentatively referred to the Deseadan (late Oligocene) taxon Rhynchippus brasiliensis. The phylogenetic analysis includes eight other 'notohippids,' three toxodontids, 2 leontiniids, and 4 'isotemnids.' The monophyly of the 'notohippids' Eurygenium and Argyrohippus is resolved, but 'Notohippidae' remains paraphyletic. Though the relationships within 'Notohippidae' are poorly known, the specimens described here increase our understanding of notoungulate diversity.

Estuarine Response to Disturbance: A Holocene Record of Storm Episodes and Seismicity as Preserved in Coastal Systems

Dillon Osleger
Department of Earth Sciences
UC Santa Barbara

Predictions of future climate change in a warming environment suggest greater climate variability and amplitude. This shift in climate variability may be expressed by an increase in severity of catastrophic events, including droughts and high-intensity storms. Central and Southern California are particularly sensitive to catastrophic events associated with these predictions as water reservoirs (supra and sub surface) remain low and associated subsidence provides space for flooding. Assessment of future climate variability within this region is dependent on a baseline of past events under varying climates. Existing records of past droughts and severe storms have been constructed on a range of time scales, including historical records, marine sediment cores, dendrochronology, and lacustrine records. Central and Southern California are also highly susceptible to powerful earthquakes which may leave a sedimentologic signature comparable to that of climate records. These archives provide a look at the impact of such extreme weather and seismic events on the broader region, but few datasets exist regarding how these hazards impacted the most heavily populated parts of southern California – its coastline.

Campus Lagoon on the University of California Santa Barbara (UCSB) campus and Las Salinas Lagoon (now the Andree Clark Bird Refuge) in the city of Santa Barbara are investigated in this study in order to better determine the frequency of past catastrophic events including storms related to atmospheric rivers and co-seismic uplift/subsidence. The objective of this investigation is to determine environmental changes recorded within lagoon systems along the Santa Barbara coastline through the mid- to late Holocene. Two specific research questions are addressed regarding hazards that impacted this system over the Holocene: A) What is the frequency of large storm events recorded within the sedimentological record? B) Is evidence found within Campus Lagoon and Las Salinas Lagoon for co-seismic uplift or subsidence?

Presented is a detailed sedimentologic and geochemical analysis of sediment cores, constrained by radiocarbon dates from these two estuarine/lagoon systems. These analyses better resolve the recurrence of large magnitude coastal events through the late Holocene.